IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	:	Naofumi KOBAYASHI
U. S. Patent No.	:	7,627,690 B2
Serial No.	:	10/771,724
Issued	:	December 1, 2009
For	:	DATA GENERATING DEVICE

April 9, 2010

Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR A CERTIFICATE OF CORRECTION

SIR:

We request a Certificate of Correction to correct the following typographical errors below:

Column 27, line 57, which was incorrectly listed as "**a number of identified clients~and**" Please change the same to read: --**a number of identified clients, and**--.

Column 28, lines 39-40, which was incorrectly listed as "**comprising: Sending unit to send each copy of multicast data**" Please change the same to read: --**comprising sending unit to send each copy of the multicast data**--.

Column 29, lines 35-36, which was incorrectly listed as "**stored in ...the forward management information,**" Please change the same to read: --**stored in the forward management information,**--.

Column 30, line 1, which was incorrectly listed as "**layer, the multicast data by changing to convert the**" Please change the same to read: --**layer, to convert the**--; line 14, which was incorrectly listed as "**the second aver of each copy of**" Please change the same to read: --**the second layer of each copy of**--; line 26, which was incorrectly listed as

"the multicast data based on of the forward" Please change the same to read: --the multicast data based on the forward--; and line 40, which was incorrectly listed as "forwarding each of the pieces of transmission copy the" Please change the same to read: --forwarding each copy of the--.

Attached, please find a copy of the pages from the Patent with column 27, 28, 29 and 30, and copies of the Responses to the Office Actions dated December 24, 2008 and June 16, 2008, which were filed on April 24, 2009 and October 16, 2008 respectively, where the claims were amended.

Any fee due as a result of this paper, may be charged to Deposit account No. 50-1290.

Respectfully submitted,

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creating company, the ISP, and the like. It is particularly herein assumed that the CDN carrier is to provide the contents distribution system based on the multicast system.

The CDN carrier sets a service for distributing the contents by normal multicasting, and a service including user management in addition to the multicast-based content distribution. At this time, in the service including the user management, the service based on information retained in the user management table **46** is provided. For example, the CDN carrier provides, based on the user management table **46**, the content creating company and the ISP with receipt contents, a receipt time thereof, etc. of each user.

In the conventional multicast, the server executes only the process of simply attaching the multicast address to the data of the contents and transmitting it. Further, the conventional multicast used UDP (User Datagram Protocol), and hence, unlike the case where TCP (Transmission Control Protocol) is utilized, it was basically impossible to grasp which client receives the multicast data and which multicast data is received. Accordingly, in the conventional multicast-based content distribution, it was impossible to grasp the user management and conditions of watching and listening to the contents.

The information provided by the CDN carrier, however, enables the contents creating company and the ISP to grasp the user management and the contents watching/listening conditions, and time-based charging per user, a calculation of an audience rating, and the like can be carried out.

Note that these services may also be provided not by the CDN carrier but by the ISP itself. Further, this service may also be conducted in such a form that the CDN carrier provides the network system itself and surrogates to distribute the content created by the content creating company.

According to the invention, in the network utilizing the multicast management protocol involving the use of the information of a layer of an unspecified or higher order (e.g., the layer 3), the switching device distributes the multicast data to only the port which the client desiring to receive the multicast data is connected to, without making any change in the switching device of a layer of a lower order (e.g., the layer 2) than the unspecified layer.

What is claimed is:

1. A data generating device comprising:

a reading unit to read out forward management information relating to a forwarding process of multicast data to be containing a multicast address as a destination address of a first layer from data of a second layer higher than the first layer, wherein each of the first layer and the second layer is one of layers defined on an OSI model;

a storage unit to store the forward management information read by the reading unit;

a data generating unit to identify one or more clients, each of which desires to receive multicast data and corresponds to a forward destination of the multicast data, based on the forward management information stored in the storage unit, to generate a same number of copies of the multicast data as a number of identified clients~ and to convert the destination address of the first layer of each copy of the multicast data being the multicast address into a first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients based on data of the first layer of each copy of the multicast data; and

a forwarding unit to forward each copy of the multicast data converted the destination address of the first layer and generated by the data generating unit to the switching device.

2. A data generating device according to claim **1**,

wherein said data generating unit determines one or more clients, each of which corresponds to the forward destination, based on the data of the second layer in the multicast data.

3. A data generating device comprising:

a reading unit to read out information relating to a forwarding process of multicast data including a multicast MAC address as a MAC destination address of a layer 2 defined on an OSI layer model from data of a layer higher than the layer 2;

a storage unit to store forward management information based on the information read by said reading unit; and

a data generating unit to identify, based on the forward management information stored in the storage unit, one or more clients, each of which corresponds to a forward destination of the multicast data, to generate a same number of copies of the received multicast data as a number of identified clients to be forwarding destinations, and to convert the MAC destination address of each copy of the multicast data being the multicast MAC address into a unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data.

4. A data generating device according to claim **3**, wherein said data generating unit determines one or more clients, each of which corresponds to the forward destination, based on the data of the layer higher than the layer 2 in the multicast data.

5. A data generating device according to claim **3**, further comprising:

Sending unit to send each copy of multicast data converted the MAC destination address and generated by said data generating unit and the received multicast data toward a downstream side.

6. A data generating device according to claim **3**, further comprising managing unit to update the forward management information stored in said storage unit on the basis of the information read by said reading unit.

7. A data generating device according to claim **6**, wherein in case the information read by said reading unit is participation information indicating a participation in a multicast group, said managing unit reflects contents of the participation information to the forward management information stored in said storage unit.

8. A data generating device according to claim **7**, wherein in case the information read by the reading unit is leaving information that indicates leaving from the multicast group, the managing unit deletes information relating to the client as a sender of the leaving information from the forward management information.

9. A data generating device according to claim **7**, further comprising time measuring unit to measure a fixed period of time,

wherein in case the time measuring unit judges that a response to a response request is not received for the fixed period of time or longer from the client, the managing unit deletes information relating to this client from the forward management information.

10. A data generating device according to claim **3**, wherein said reading unit reads the information from a message of Internet group management protocol version 3.

11. A data generating device according to claim **3**, wherein said reading unit reads the information from a message of multicast listener discovery version 2.

12. A data generating device according to claim **3**, wherein said managing unit, when a message of internet group management protocol version 1 or version 2 is received, changes the forward management information on the basis of specifications of the internet group management protocol version 1 or version 2.

13. A data generating device according to claim **3**, wherein said storage unit stores the forward management information including correspondence between an address of the client to which multicast data should be forwarded and a destination address of the multicast data.

14. A data generating device according to claim **13**, wherein said storage unit stores the forward management information further including a source address of the multicast data.

15. A data generating device according to claim **8**, wherein said storage unit stores the forward management information including correspondence between an address of the client to which multicast data should be forwarded and a destination address of the multicast data, and the data generating device further comprises client management information storage unit to store client management information based on the forward management information, wherein the client management information include a client identifier indicating the client to which the multicast data should be forwarded, a destination identifier indicating a transmission destination of the multicast data, a time when relationship between the client and the transmission destination of the multicast data have been stored in the forward management information, and a time when the relationship have been deleted from the forward management information.

16. A data generating device according to claim **8**, wherein said storage unit stores the forward management information including correspondence between an address of the client to which the multicast data should be forwarded, a destination address of the multicast data and a source address of the multicast data, and the data generating device further comprises client management information storage unit to store client management information based on the forward management information, wherein the client management information include a client identifier indicating the client to which the multicast data should be forwarded, a destination identifier indicating a transmission destination of the multicast data, a source identifier indicating a transmission source of the multicast data, a time when relationship between the client and the transmission destination of the multicast data have been stored in the forward management information, and a time when the relationship have been deleted from the forward management information.

17. A data generating device comprising:

a storage unit to store data relating to one or more clients desiring to receive multicast data to be forwarded to one or more clients based on a protocol of a first layer, wherein the multicast data includes an multicast address as an destination address of a second layer lower than the first layer, and each of the first layer and the second layer is one of layers defined on an OSI model; and

a data generating unit to generate, when accepts the multicast data, copies of the multicast data per client to be forwarded thereto based on a protocol of the second

layer, ~~the multicast data by changing~~ to convert the destination address of the second layer of each copy of the multicast data being the multicast address into an address of the client desiring to receive the multicast data, on the basis of the data relating to one or more clients that have been stored in said storage unit, and to give the copies of the multicast data per client to a sending unit to send the each copy of the multicast data toward one or more second layer switches accommodating one or more clients so that one or more second layer switches device receive each copy of the multicast data converted the destination address of the second layer to forward each copy of the multicast data to one or more clients based on data of the second _aver_ of each copy of the multicast data.

18. A data generating method executed by an information processing device, comprising:

reading forward management information on a forwarding process of multicast data to be containing a multicast address as a destination address of a first layer from data of a second layer higher than the first layer, wherein each of the first layer and the second layer is one of layers defined on an OSI model;

identifying one or more clients, each of which desires to receive multicast data and corresponds to a forward destination of the multicast data based on _of_ the forward management information;

generating a same number of copies of multicast data as a number of identified clients;

converting the destination address of the first layer of each copy of the multicast data being the multicast address into an first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients based on data of the first layer of each copy of the multicast data; and

forwarding each ~~of the pieces of transmission~~ copy the multicast data converted the destination address of the first layer to the switching device.

19. A data generating method comprising:

reading information relating to a forwarding process of multicast data including a multicast MAC address as a MAC destination address of layer 2 defined on an OSI layer model from data of a layer higher than the layer 2;

storing forward management information based on the readout information;

identifying, based on the stored forward management information, one or more clients, each of which corresponds to a forward destination of the multicast data;

generating, from the multicast data, a same number of copies of the received multicast data as a number of identified clients to be forwarding destinations; and

converting the MAC destination address of each copy of the multicast data being the multicast MAC address into an unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data.

* * * * *

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):   NAOFUMI KOBAYASHI

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Serial No.:   10/771,724

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Title: DATA GENERATING DEVICE

Examiner: David Eng

Group Art Unit: 2455

April 24, 2009

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

S I R:

In response to the Office Action of December 24, 2008, please note Customer No. 26304, please charge any fees, including any necessary extension fees, to Deposit Account 50-1290, please amend the application as follows: :

IN THE CLAIMS

1. (currently amended) A data generating device ~~installed on an upstream side of a switching device for performing switching based on data of a first layer,~~ comprising:

a reading unit to read out forward management information relating to a forwarding process of ~~forward~~ multicast data to be containing a multicast address as a destination address of a first layer ~~to be forwarded to one or more clients~~ from data of a second layer higher than the first layer, wherein each of the first layer and the second layer is one of layers defined on an OSI model;

a storage unit to store the forward management information read by [[said]]the reading unit;

a data generating unit to identify one or more clients, each of which desires to receive multicast data and corresponds to a forward destination of the ~~forward~~ multicast data, based on the forward management information stored in [[said]]the storage unit, [[and]] to generate a same number of copies of the multicast ~~pieces of transmission~~ data as a number of identified clients, and to convert the destination address of the first layer of each copy of the multicast data being the multicast address into a first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients based on data of the first layer of each copy of the multicast data ~~wherein each of the pieces of transmission data includes equivalent contents to the forward data and has an address of a corresponding one of the identified clients as a destination address of the first layer of the transmission data.~~; and

a forwarding unit to forward each ~~piece of transmission~~ copy of the multicast data converted the destination address of the first layer and generated by [[said]]the data generating unit to the switching device.

2. (currently amended) A data generating device according to claim 1,

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wherein said data generating unit determines one or more clients, each of which corresponds to the forward destination, based on the data of the second layer in the ~~forward~~ multicast data.

3. (previously canceled)

4. (currently amended) A data generating device comprising:

a reading unit to read out information relating to a forwarding process of multicast data including a multicast MAC address as a MAC destination address of a layer 2 defined on an OSI layer model from data of a layer higher than the layer 2;

a storage unit to store forward management information based on the information read by said reading unit; and

a data generating unit to identify, based on the forward management information stored in the storage unit, one or more clients, each of which corresponds to a forward destination of the multicast data, to generate a same number of copies of the received multicast data as a number of identified clients to be forwarding destinations, and to convert ~~transform each copy of the~~ ~~multicast data into unicast data by changing~~ the MAC destination address ~~of the layer 2~~ of each copy of the multicast data being[[from]] the multicast MAC address into a unicast MAC ~~the~~ ~~layer 2~~ address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data~~, wherein each of the pieces of unicast data is transmitted to each~~ ~~of the identified clients.~~

5. (original)

6. (canceled)

7. (currently amended) A data generating device according to claim 4, further comprising [← sending unit to send each copy of ~~pieces of~~ the ~~unicast~~ multicast data converted the MAC

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destination address and generated by said data generating unit and the received multicast data toward a downstream side.

8-18.(original)

19. (currently amended) A data generating device comprising:

a storage unit to store data relating to one or more clients desiring to receive multicast data to be forwarded to one or more clients based on a protocol of a first layer, wherein the multicast data includes an multicast address as an destination address of a second layer lower than the first layer, and each of the first layer and the second layer is one of layers defined on an OSI model; and

a data generating unit to generate, when accepts the multicast data, copies of the multicast data unicast data per client to be forwarded thereto based on a protocol of the second layer, from the multicast data by changing to convert the destination address of the second layer of each copy of the multicast data being [[from]] the multicast address [[to]] into an address of the client desiring to receive the multicast data, on the basis of the data relating to one or more clients that have been stored in said storage unit, and to give the unicast data the copies of the multicast data per client to a sending unit to send the each copy of the multicast data unicast data toward one or more second layer switches accommodating one or more clients so that one or more second layer switches device receive each copy of the multicast data converted the destination address of the second layer to forward each copy of the multicast data to one or more clients based on data of the second layer of each copy of the multicast data.

20.-21. Cancelled.

22. (currently amended) A data generating method executed by an information processing device installed on an upstream side of a switching device for performing switching based on data of a first layer, comprising:

reading forward management information on a forwarding process of forward multicast data to be containing a multicast address as a destination address of a first layer to be forwarded

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to one or more clients from data of a second layer higher than the first layer, wherein each of the first layer and the second layer is one of layers defined on an OSI model;

identifying one or more clients, each of which desires to receive multicast data and corresponds to a forward destination of the forward multicast data based on of the forward management information;

generating a same number of pieces of transmission copies of multicast data as a number of identified clients[[,]];

converting the destination address of the first layer of each copy of the multicast data being the multicast address into an first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients based on data of the first layer of each copy of the multicast data wherein each of the pieces of transmission data includes equivalent contents to the forward data and has an address of a corresponding one of the identified clients as a destination address of the first layer of the transmission data; and forwarding each of the pieces of transmission copy the multicast data converted the destination address of the first layer to the switching device.

23. (currently amended) A data generating method comprising:

reading information relating to a forwarding process of multicast data including a multicast MAC address as a MAC destination address of layer 2 defined on an OSI layer model from data of a layer higher than the layer 2;

storing forward management information based on the readout information;

identifying, based on the stored forward management information, one or more clients, each of which corresponds to a forward destination of the multicast data; [[and]]

generating, from the multicast data, a same number of copies of the received multicast data as a number of identified clients to be forwarding destinations;[[,]] and [[to]]

converting transform each copy of the multicast data into unicast data by changing the MAC destination address of the layer 2 of each copy of the multicast data [[from]] being the multicast MAC address into the layer 2 an unicast MAC address of a corresponding one of the

identified clients as a destination address of the layer 2 of the data <u>so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data.</u>

24.-25. Cancelled

REMARKS

An office Action was mailed December 24, 2008. The response is timely. Any fee due with this paper, including any necessary extension fees, may be charged on Deposit Account 50-1290.

Favorable reconsideration of this application is respectfully requested in view of the foregoing amendments and the following remarks.

Summary

By the foregoing, claims 1, 2, 4, 7, 19, 22, and 23 have been amended. No new matter is added. Claim 6 has been canceled without prejudice or disclaimer of the subject matter contained therein.

Thus, claims 1-2, 4-5, and 7-25 are pending in the present application. Claims 20-21 and 24-25 were withdrawn from consideration and are now cancelled, as requested. Claims 1, 4, 19, 22, and 23 are the independent claims that are being examined.

Rejections under 35 U.S.C. §112

Claims 1-2, 19 and 22 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite for regarding the recitation of the first and second layer. By the foregoing amendments, the claims have been amended to more particularly out and distinctly claim their subject matter. Accordingly, withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. §103(a)

Claims 1-2, 4-19, and 22-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,934,759 to Hejna in view of U.S. Patent No. 7,254,138 to Sandstrom.

Claims 1-2, 4-19, and 22-23 also stand rejected under 35 U.S.C. §103(a) as being unpatentable over Hejna in view of U.S. Patent No. 7,450,580 to Itonaga.

With regard to independent claim 1, claim 1 recites the features of

> *"a data generating unit to convert the destination address of the first layer of each copy of the multicast data being the multicast address into a first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients based on data of the first layer of each copy of the multicast data."*

As discussed below, at least these features of claim 1 are a distinction over Hejna, and, thus, over its combination with Sandstrom and Itonaga.

In contrast, Hejna merely scratches the surface of the subject and teaches that:

> *"In accordance with the present invention, Multicaster 3300 manages a list of all clients that should receive data from particular portions of the TDM composite signal in accordance with any one of a number of methods which are well known to those of ordinary skill in the art. Then, whenever the particular portion of data in the TDM composite signal is received from Work Streamer 3200, Multicaster 3300 sends the particular portion of data to all clients (recipients) in the list who are to receive the particular portion of data (also known as multicasting)."* 10:40-50.

As is evident from the above selection, Hejna merely describes that the Multicaster 3300 performs multicasting. Indeed, the rejection concurs in the deficiency of Hejna, specifically at 4:20-22 of the Office Action, it is acknowledged that

> *"Hejna does not teach converting multicast addresses to unicast addresses so that the same number of copies of forwarding data corresponding to the number of unicast addresses can be made and forwarded."*

Therefore, Hejana does not disclose, suggest or teach the noted features of claim 1. The noted features of claim 1, namely *"a data generating unit to convert the destination address of the first layer of each copy of the multicast data being the multicast address into a first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more*

clients based on data of the first layer of each copy of the multicast data" are a distinction over Hejna.

In the Abstract, Sandstrom that

> *"the invention provides look-up-free and packet-layer-protocol transparent forwarding of multi-protocol packet traffic among Layer-N (N=2 or upper in the ISO OSI model) nodes."*

Thus, Sandstrom merely discloses forwarding transparently multi-protocol packet traffic among Layer-N nodes. Sandstrom does not disclose, suggest, or teach the noted features of claim 1. Therefore, the previously noted features of claim 1 are a distinction over Sandstrom.

Itonaga teaches at 6:23-26 that

> *"[e]ach of the copy entries 42 is information of a next hop node to which a copy of the content data is to be transferred, including at least the IP address of the next hop node or a data receiving host"*

Further, Itonaga teaches at 7:65-8:06 that

> *"[t]he data copying section 222 uses the data ID of the received content data to search the copy entry information 40 of the copy entry controller 221 for a root entry 41 and check receiving device information 42 of the root entry 41 (step S21). Thereafter, the data copying section 222 converts the destination IP address of the content data to IP address included in the receiving device information 42 (step S22) and sends the content data as unicast data to the IP address of the receiving device (step S23)"*

As the selection makes clear, Itonaga merely discloses converting the destination IP address of the content data to the IP address of the next hop node. Itonaga does not teach, disclose, or suggest converting the destination address of the first layer of each copy of the multicast data being the multicast address into a first layer address of a corresponding one of the identified clients accommodated by the switch device so that the switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more

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clients. Thus, Itonaga does not disclose, suggest, or teach the noted features of claim 1. Therefore, the noted features of claim 1 discussed above are a distinction over Itonaga.

Among other things, a *prima facie* case of obviousness must establish that the asserted combination of references teaches or suggests each and every element of the claimed invention. In view of the distinction of claim 1 noted above, at least one claimed element is not present in the asserted combination of references. Hence, the Office Action fails to establish a *prima facie* case of obviousness vis-à-vis claim 1. The cited references fail to fill the gap or permit one skilled in the art to adapt the other references to a different outcome.

Claim 2 ultimately depend from claim 1 and so at least similarly distinguish over the asserted combination of references.

Accordingly, the Examiner is respectfully requested to withdraw the rejection.

With regard to independent claim 4, claim 4 recites features of

> "*a data generating unit to convert the MAC destination address of each copy of the multicast data being the multicast MAC address into a unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data*".

As will be explained below, at least these features of claim 4 are a distinction over Hejna, and, thus, over its combination with Sandstrom and Itonaga.

Hejna merely describes Multicaster 3300 performs multicasting 10:40-50. Indeed, the rejection concurs in the deficiency of Hejna, specifically at 4:20-22 of the Office Action, it is acknowledged that

> "*Hejna does not teach converting multicast addresses to unicast addresses so that the same number of copies of forwarding data corresponding to the number of unicast addresses can be made and forwarded.*"

Therefore, Hejna does not disclose, suggest or teach the noted features of claim 4. The noted features of claim 4, *namely "a data generating unit to convert the MAC destination address of each copy of the multicast data being the multicast MAC address into a unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data"* are a distinction over Hejna.

Sandstrom merely discloses forwarding transparently multi-protocol packet traffic among Layer-N nodes (see abstract). Sandstrom does not disclose, suggest, or teach the noted features of claim 4. Therefore, the noted features of claim 4, namely *"a data generating unit to convert the MAC destination address of each copy of the multicast data being the multicast MAC address into a unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data"* are a distinction over Sandstrom.

Itonaga merely discloses converting the destination IP address of the content data to the IP address of the next hop node. Please see 6:23-26,7:65-8:6. Itonaga does not teach, disclose, or suggest converting the MAC destination address of each copy of the multicast data being multicast MAC address to into an unicast MAC address of a corresponding one of the identified clients accommodated by the switch device so that the switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients. Itonaga et al. do not disclose, suggest, or teach the noted features of claim 4. Therefore, the noted features of claim 4 discussed above are a distinction over Itonaga.

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Among other things, a *prima facie* case of obviousness must establish that the asserted combination of references teaches or suggests each and every element of the claimed invention. In view of the distinction of claim 4 noted above, at least one claimed element is not present in the asserted combination of references. Hence, the Office Action fails to establish a *prima facie* case of obviousness vis-à-vis claim 4. The cited references fail to fill the gap or permit one skilled in the art to adapt the other references to a different outcome.

Claim 5 and 7-18 ultimately depend from claim 4, respectively, and so at least similarly distinguish over the asserted combination of references.

Accordingly, the Examiner is respectfully requested to withdraw the rejection.

With reference to independent claim 19, claim 19 recites features of

> "*a data generating unit to convert the destination address of the second layer of each copy of the multicast data being the multicast address into an address of the client desiring to receive the multicast data, on the basis of the data relating to one or more clients that have been stored in said storage unit so that one or more second layer switches device receive each copy of the multicast data converted the destination address of the second layer to forward each copy of the multicast data to one or more clients based on data of the second layer of each copy of the multicast data.*"

As will be explained below, at least these features of claim 19 are a distinction over Hejna, and, thus, over its combination with Sandstrom and Itonaga.

Hejna merely describes Multicaster 3300 performs multicasting 10:40-50. Indeed, the rejection concurs in the deficiency of Hejna, specifically at 4:20-22 of the Office Action, it is acknowledged that

> "*Hejna does not teach converting multicast addresses to unicast addresses so that the same number of copies of forwarding data corresponding to the number of unicast addresses can be made and forwarded.*"

Therefore, Hejana does not disclose, suggest or teach the noted features of claim 19. The noted features of claim 19, namely "*a data generating unit to convert the destination address of the*

second layer of each copy of the multicast data being the multicast address into an address of the client desiring to receive the multicast data, on the basis of the data relating to one or more clients that have been stored in said storage unit so that one or more second layer switches device receive each copy of the multicast data converted the destination address of the second layer to forward each copy of the multicast data to one or more clients based on data of the second layer of each copy of the multicast data" are a distinction over Hejna.

Sandstrom merely discloses forwarding transparently multi-protocol packet traffic among Layer-N nodes (see abstract). Sandstrom does not disclose, suggest, or teach the noted features of claim 19. Therefore, the noted features of claim 19, namely are a distinction over Sandstrom.

Itonaga merely discloses converting the destination IP address of the content data to the IP address of the next hop node. Please see 6:23-26, 7:65-8:06. Itonaga does not teach, disclose, or suggest converting the destination address of the second layer of each copy of the multicast data being the multicast address into an address of the client desiring to receive the multicast data so that one or more second layer switches device accommodating the client receive each copy of the multicast data converted the destination address of the second layer to forward each copy of the multicast data to one or more clients. Itonaga does not disclose, suggest, or teach the noted features of claim 19. Therefore, the noted features of claim 19 discussed above are a distinction over Itonaga.

Among other things, a *prima facie* case of obviousness must establish that the asserted combination of references teaches or suggests each and every element of the claimed invention. In view of the distinction of claim 19 noted above, at least one claimed element is not present in the asserted combination of references. Hence, the Office Action fails to establish a *prima facie* case of obviousness vis-à-vis claim 19. The cited references fail to fill the gap or permit one skilled in the art to adapt the other references to a different outcome.

Accordingly, the Examiner is respectfully requested to withdraw the rejection.

With regard to independent claim 22, claim 22 recites features of

> *"converting the destination address of the first layer of each copy of the multicast data being the multicast address into an first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients based on data of the first layer of each copy of the multicast data".*

As will be explained below, at least these features of claim 22 are a distinction over Hejna, and thus over its combination with Sandstrom and Itonaga.

In contrast, Hejna merely scratches the surface of the subject and teaches that:

> *"In accordance with the present invention, Multicaster 3300 manages a list of all clients that should receive data from particular portions of the TDM composite signal in accordance with any one of a number of methods which are well known to those of ordinary skill in the art. Then, whenever the particular portion of data in the TDM composite signal is received from Work Streamer 3200, Multicaster 3300 sends the particular portion of data to all clients (recipients) in the list who are to receive the particular portion of data (also known as multicasting)."* 10:40-50.

As is evident from the above selection, Hejna merely describes that the Multicaster 3300 performs multicasting. Indeed, the rejection concurs in the deficiency of Hejna, specifically at 4:20-22 of the Office Action, it is acknowledged that

> *"Hejna does not teach converting multicast addresses to unicast addresses so that the same number of copies of forwarding data corresponding to the number of unicast addresses can be made and forwarded."*

Therefore, Hejana does not disclose, suggest or teach the noted features of claim 22. The noted features of claim 22, namely *"converting the destination address of the first layer of each copy of the multicast data being the multicast address into an first layer address of a corresponding one of the identified clients so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients based on data of the first layer of each copy of the multicast data",* are a distinction over Hejna.

Sandstrom merely discloses forwarding transparently multi-protocol packet traffic among Layer-N nodes. Please see Abstract. Sandstrom does not disclose, suggest, or teach the noted features of claim 22. Therefore, the noted features of claim 22 discussed above are a distinction over Sandstrom.

Itonaga merely discloses converting the destination IP address of the content data to the IP address of the next hop node. Please see 6:23-26, 7:65-8:06. Itonaga does not teach, disclose, or suggest converting the destination address of the first layer of each copy of the multicast data being the multicast address into a first layer address of a corresponding one of the identified clients accommodated by the switch device so that the switching device accommodating the identified one or more clients receives each copy of the multicast data converted the destination address of the first layer to forward each copy of the multicast data to the identified one or more clients. Itonaga does not disclose, suggest, or teach the noted features of claim 22. Therefore, the noted features of claim 22 discussed above are a distinction over Itonaga et al.

Among other things, a *prima facie* case of obviousness must establish that the asserted combination of references teaches or suggests each and every element of the claimed invention. In view of the distinction of claim 22 noted above, at least one claimed element is not present in the asserted combination of references. Hence, the Office Action fails to establish a *prima facie* case of obviousness vis-à-vis claim 22. The cited references fail to fill the gap or permit one skilled in the art to adapt the other references to a different outcome.

Accordingly, the Examiner is respectfully requested to withdraw the rejection.

With regard to independent claim 23, claim 23 recites features of

> *"converting the MAC destination address of each copy of the multicast data being the multicast MAC address into an unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the*

multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data."

As will be explained below, at least these features of claim 23 are a distinction over Hejna, and thus over its combination with Sandstrom and Itonaga.

In contrast, Hejna merely scratches the surface of the subject and teaches that:

> *"In accordance with the present invention, Multicaster 3300 manages a list of all clients that should receive data from particular portions of the TDM composite signal in accordance with any one of a number of methods which are well known to those of ordinary skill in the art. Then, whenever the particular portion of data in the TDM composite signal is received from Work Streamer 3200, Multicaster 3300 sends the particular portion of data to all clients (recipients) in the list who are to receive the particular portion of data (also known as multicasting)."* 10:40-50.

As is evident from the above selection, Hejna merely describes that the Multicaster 3300 performs multicasting. Indeed, the rejection concurs in the deficiency of Hejna, specifically at 4:20-22 of the Office Action, it is acknowledged that

> *"Hejna does not teach converting multicast addresses to unicast addresses so that the same number of copies of forwarding data corresponding to the number of unicast addresses can be made and forwarded."*

Therefore, Hejana does not disclose, suggest or teach the noted features of claim 23. The noted features of claim 23, namely "converting the MAC destination address of each copy of the multicast data being the multicast MAC address into an unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data", are a distinction over Hejna.

Sandstrom merely discloses forwarding transparently multi-protocol packet traffic among Layer-N nodes. Please see Abstract. Sandstrom does not disclose, suggest, or teach the noted features

of claim 23. Therefore, the noted features of claim 23, namely *"converting the MAC destination address of each copy of the multicast data being the multicast MAC address into an unicast MAC address of a corresponding one of the identified clients as a destination address of the layer 2 of the data so that a switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients based on data of the layer 2 of each copy of the multicast data"* are a distinction over Sandstrom.

Itonaga merely discloses converting the destination IP address of the content data to the IP address of the next hop node. Please see 6:23-26, 7:65-8:06. Itonaga does not teach, disclose, or suggest converting the MAC destination address of each copy of the multicast data being multicast MAC address to into an unicast MAC address of a corresponding one of the identified clients accommodated by the switch device so that the switching device accommodating the identified one or more clients receives each copy of the multicast data converted the MAC destination address to forward each copy of the multicast data to the identified one or more clients. Itonaga et al. do not disclose, suggest, or teach the noted features of claim 23. Therefore, the noted features of claim 23 are a distinction over Itonaga et al.
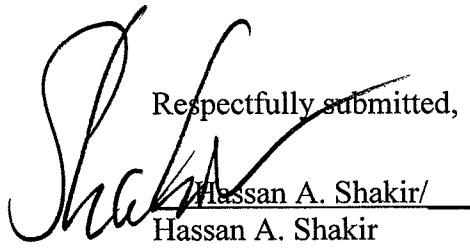
Among other things, a *prima facie* case of obviousness must establish that the asserted combination of references teaches or suggests each and every element of the claimed invention. In view of the distinction of claim 23 noted above, at least one claimed element is not present in the asserted combination of references. Hence, the Office Action fails to establish a *prima facie* case of obviousness vis-à-vis claim 23. The cited references fail to fill the gap or permit one skilled in the art to adapt the other references to a different outcome.

Accordingly, the Examiner is respectfully requested to withdraw the rejection.

In view of the foregoing discussion, the rejection of claims 1-2, 4-5, 7-19, and 22-23 is improper. Accordingly, withdrawal of the rejection is respectfully requested. All dependent claims are allowable for at least the same reasons as the independent claim from which they depend.

In view of the remarks set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,

/Hassan A. Shakir/
Hassan A. Shakir
Reg. No. 53,922
212.940.6489

CUSTOMER NUMBER 026304
Docket No.: FUJY 20.944 (100794-00552)

U.S. Serial No. 10/771,724
84370702_1_100794_00552_FUJY 20.944 Response to OA of 12.14.2008

<u>Attorney Docket No.: FUJY 20.944 (100794-00552)</u>

<u>IN THE UNITED STATES PATENT AND TRADEMARK OFFICE</u>

Inventor(s):   NAOFUMI KOBAYASHI

Confirmation No.:   4952

Serial No.:   10/771,724

Filed: February 4, 2004

Title: DATA GENERATING DEVICE

Examiner: David Eng

Group Art Unit: 2155

October 16, 2008

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

<u>RESPONSE TO OFFICE ACTION</u>

SIR:

Applicant hereby petitions for a one-month extension of time, a petition pursuant to

37 C.F.R. 1.136(a) and a requisite fee being enclosed.

In connection with the Request for Continued Examination ("RCE") filed

concurrently herewith and in response to the final Office Action dated June 16, 2008, please

amend the subject application as follows:

IN THE CLAIMS

1. **(currently amended)** A data generating device installed on an upstream side of a switching device for performing switching based on data of a first layer, comprising:

a reading unit to read out forward management information relating to a forwarding process of forward data to be forwarded to one or more clients from data of a second layer higher than the first layer;

a storage unit to store the forward management information read by said reading unit;

a data generating unit to identify one or more clients, each of which corresponds to a forward destination of the forward data, based on the forward management information stored in said storage unit, and ~~generating the~~ to generate a same number of pieces of transmission data as ~~the~~ a number of identified clients ~~in order to transmit each piece of transmission data to each client corresponding to the forward destination~~, wherein each of the pieces of transmission data includes equivalent contents to the forward data and has an address of a corresponding one of the identified clients as a destination address of the first layer of the transmission data; and

a forwarding unit to forward each piece of transmission data generated by said data generating unit to the switching device.

2. (Original) A data generating device according to claim 1, wherein said data generating unit determines one or more clients, each of which corresponds to the forward destination, based on the data of the second layer in the forward data.

3. **(canceled)**

4. **(currently amended)** A data generating device comprising:

a reading unit to read out information relating to a forwarding process of multicast

data including a multicast address as a destination address of layer 2 defined on an OSI layer

model from data of a layer higher than a the layer 2 defined on OSI layer model;

a storage unit to store forward management information based on the information read

by said reading unit; and

a data generating unit to identify, based on the forward management information

stored in the storage unit, one or more clients, each of which corresponds to a forward

destination of the multicast data, and to generate the a same number of copies of the received

multicast data as the a number of identified clients to be forwarding destinations, and to

transform each copy of the multicast data into unicast data by changing the destination

address of the layer 2 of each copy of the multicast data from the multicast address into the

layer 2 address of a corresponding one of the identified clients as a destination address of the

layer 2 of the data, wherein each of the pieces of unicast data is transmitted to each of the

identified clients.

5. (Original) A data generating device according to claim 4, wherein said data

generating unit determines one or more clients, each of which corresponds to the forward

destination, based on the data of the layer higher than the layer 2 in the multicast data.

6. (Original) A data generating device according to claim 4, wherein said data

generating unit generates the unicast data having a MAC address of the client which is

identified, as a MAC destination address.

7. (Original) A data generating device according to claim 4, further comprising

sending unit to send each of pieces of the unicast data generated by said data generating unit

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and the multicast data toward a downstream side.

8. (Original) A data generating device according to claim 4, further comprising managing unit to update the forward management information stored in said storage unit on the basis of the information read by said reading unit.

9. (Original) A data generating device according to claim 8, wherein in case the information read by said reading unit is participation information indicating a participation in a multicast group, said managing unit reflects contents of the participation information to the forward management information stored in said storage unit.

10. (Original) A data generating device according to claim 9, wherein in case the information read by the reading unit is leaving information that indicates leaving from the multicast group, the managing unit deletes information relating to the client as a sender of the leaving information from the forward management information.

11.(Original) A data generating device according to claim 9, further comprising time measuring unit to measure a fixed period of time,

wherein in case the time measuring unit judges that a response to a response request is not received for the fixed period of time or longer from the client, the managing unit deletes information relating to this client from the forward management information.

12. (Original) A data generating device according to claim 4, wherein said reading unit reads the information from a message of Internet group management protocol version 3.

13. (Original) A data generating device according to claim 4, wherein said reading

unit reads the information from a message of multicast listener discovery version 2.

14. (Original) A data generating device according to claim 4, wherein said managing

unit, when a message of internet group management protocol version 1 or version 2 is

received, changes the forward management information on the basis of specifications of the

internet group management protocol version 1 or version 2.

15. (Original) A data generating device according to claim 4, wherein said storage

unit stores the forward management information including correspondence between an

address of the client to which multicast data should be forwarded and a destination address of

the multicast data.

16. (Original) A data generating device according to claim 15, wherein said storage

unit stores the forward management information further including a source address of the

multicast data.

17. (Original) A data generating device according to claim 10, wherein said storage

unit stores the forward management information including correspondence between an

address of the client to which multicast data should be forwarded and a destination address of

the multicast data, and the data generating device further comprises client management

information storage unit to store client management information based on the forward

management information, wherein the client management information include a client

identifier indicating the client to which the multicast data should be forwarded, a destination

identifier indicating a transmission destination of the multicast data, a time when relationship

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between the client and the transmission destination of the multicast data have been stored in the forward management information, and a time when the relationship have been deleted from the forward management information.

18. (Original) A data generating device according to claim 10, wherein said storage unit stores the forward management information including correspondence between an address of the client to which the multicast data should be forwarded, a destination address of the multicast data and a source address of the multicast data, and the data generating device further comprises client management information storage unit to store client management information based on the forward management information, wherein the client management information include a client identifier indicating the client to which the multicast data should be forwarded, a destination identifier indicating a transmission destination of the multicast data, a source identifier indicating a transmission source of the multicast data, a time when relationship between the client and the transmission destination of the multicast data have been stored in the forward management information, and a time when the relationship have been deleted from the forward management information.

19. **(currently amended)** A data generating device comprising:

a storage unit to store data relating to one or more clients desiring to receive multicast data to be forwarded to one or more clients based on a protocol of a first layer, wherein the multicast data includes a multicast address as a destination address of a second layer lower than the first layer; and

a data generating unit to generate, when accepts the multicast data, unicast data per client to be forwarded thereto based on a protocol of a the second layer lower than the first layer, from the multicast data by changing the destination address of the second layer from

the multicast address to an address of the client desiring to receive the multicast data, on the

basis of the data relating to the one or more clients that have been stored in said storage unit,

and to give the unicast data per client to a sending unit to send the unicast data toward one or

more second layer switches accommodating the one or more clients.

20. (Withdrawn) A client management device comprising:

reading unit to read information relating to a multicast data forwarding process;

storage unit to store forward management information based on the information read

by said reading unit, wherein the forward management information includes correspondence

between an address of a client to which multicast data should be forwarded and a destination

address of the multicast data;

data generating unit to identify, based on the forward management information stored

in said storage unit, one or more clients, each of which corresponds to a forward destination

of the multicast data, and generating the same number of pieces of unicast data as the number

of identified clients, from the multicast data;

managing unit to reflect, in case the information read by said reading unit is

participation information indicating a participation in a multicast group, contents of the

participation information to the forward management information stored in said storage unit,

and for deleting, in case the information read by said reading unit is leaving information that

indicates leaving from the multicast group, information relating to the client as a sender of the

leaving information form the forward management information; and

client management information storage unit to storing client management information

based on the forward management information, wherein the client management information

include a client identifier indicating the client to which the multicast data should be

forwarded, a destination identifier indicating a transmission destination of the multicast data,

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a time when relationship between the client and the transmission destination of the multicast

data have been stored in the forward management information, and a time when the

relationship have been deleted from the forward management information.

21. (Withdrawn) A client management device comprising:

reading unit to read information relating to a multicast forwarding process;

storage unit to store forward management information based on the information read

by said reading unit, wherein the forward management information include an address of a

client to which multicast data should be forwarded, a destination address of the multicast data

and a source address of the multicast data;

data generating unit to identify, based on the forward management information stored

in said storage unit, one or more clients, each of which corresponds to a forward destination

of the multicast data, and generating the same number of pieces of unicast data as the number

of identified clients from the multicast data;

managing unit to reflect, in case the information read by the reading unit is

participation information indicating a participation in a multicast group, contents of the

participation information to the forward management information stored on the storage unit,

and for deleting, in case the information read by the reading unit is leaving information that

indicates leaving from the multicast group, information relating to the client as a sender of the

leaving information form the forward management information; and

client management information storage unit to store client management information

based on the forward management information, wherein the client management information

include a client identifier indicating the client to which the multicast data should be

forwarded, a destination identifier indicating a transmission destination of the multicast data,

a source identifier indicating a transmission source of the multicast data, a time when

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relationship between the client and the transmission destination of the multicast data have

been stored in the forward management information, and a time when the relationship have

been deleted from the forward management information.

22. **(currently amended)** A data generating method executed by an information

processing device installed on an upstream side of a switching device for performing

switching based on data of a first layer, comprising:

reading forward management information on a forwarding process of forward data to

be forwarded to one or more clients from data of a second layer higher than the first layer;

identifying one or more clients, each of which corresponds to a forward destination of

the forward data based on the forward management information;

generating the a same number of pieces of transmission data as the a number of

identified clients in order to transmit each piece of transmission data to each client

corresponding to the forward destination, wherein each of the pieces of transmission data

includes equivalent contents to the forward data and has an address of a corresponding one of

the identified clients as a destination address of the first layer of the transmission data; and

forwarding each of the pieces of transmission data to the switching device.

23. **(currently amended)** A data generating method comprising:

reading information relating to a forwarding process of multicast data including a

multicast address as a destination address of layer 2 defined on an OSI layer model from data

of a layer higher than a the layer 2 defined in OSI layer model;

storing forward management information based on the readout information;

identifying, based on the stored forward management information, one or more

clients, each of which corresponds to a forward destination of the multicast data; and

generating, from the multicast data, ~~the~~ a same number of copies of the received

multicast data as ~~the~~ a number of identified clients to be forwarding destinations, and to

transform each copy of the multicast data into unicast data by changing the destination

address of the layer 2 of each copy of the multicast data from the multicast address into the

layer 2 address of a corresponding one of the identified clients as a destination address of the

layer 2 of the data, wherein each of the pieces of unicast data is transmitted to each of the

identified clients.

24. (Withdrawn) A client management method comprising:

reading information relating to a forwarding process of multicast data;

storing forward management information based on the readout information, wherein

the forward management information includes correspondence between an address of a client

to which the multicast data should be forwarded and a destination address of the multicast

data;

identifying, based on the forward management information, one or more clients, each

of which corresponds to a forward destination of the multicast data;

generating, from the multicast data, the same number of pieces of unicast data as the

number of identified clients;

reflecting, in case the readout information is participation information indicating a

participation in a multicast group, contents of the participation information to the stored

forward management information;

deleting, in case the readout information is leaving information that indicates leaving

from the multicast group, information relating to the client as a sender of the leaving

information form the forward management information; and

storing client management information based on the forward management

information, wherein the client management information include correspondence between a

client identifier indicating the client to which the multicast data should be forwarded, a

destination identifier indicating a transmission destination of the multicast data, a time when

relationship between the client and the transmission destination of the multicast data have

been stored in the forward management information, and a time when the relationship have

been deleted from the forward management information.

25. (Withdrawn) A client management method comprising:

reading information relating to a forwarding process of multicast data;

storing forward management information based on the readout information, wherein

the forward management information include correspondence between an address of a client

to which the multicast data should be forwarded, a destination address of the multicast data

and a source address of the multicast data;

identifying, based on the forward management information, one or more clients, each

of which corresponds to a forward destination of the multicast data;

generating, from the multicast data, the same number of pieces of unicast data as the

number of identified clients;

reflecting, in case the readout information is participation information indicating a

participation in a multicast group, contents of the participation information to the forward

management information;

deleting, in case the readout information is leaving information that indicates leaving

from the multicast group, information relating to the client as a sender of the leaving

information form the forward management information; and

storing client management information based on the forward management

information, wherein the client management information include a client identifier indicating

the client to which the multicast data should be forwarded, a destination identifier indicating

a transmission destination of the multicast data, a source identifier indicating a transmission

source of the multicast data, a time when relationship between the client and the transmission

destination of the multicast data have been stored in the forward management information,

and a time when the relationship have been deleted from the forward management

information.

REMARKS

Applicant cancels claim 3. Claims 1-2 and 4-25 remain pending in the application.

Claims 20-21 and 24-25 have been withdrawn from consideration. Applicant amends claims

1, 4, 19, and 22-23 for further clarification. No new matter has been added.

THE REJECTION UNDER 35 U.S.C. § 112

Claims 4-18 and 23 stand rejected under 35 U.S.C. §112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter of the

invention.

Independent claims 4 and 23 recite the features of identifying, based on forward

management information stored in a storage unit, one or more clients, each of which

corresponds to a forward destination of multicast data, generating a same number of copies of

received multicast data as a number of identified clients to be forwarding destinations, and

transforming each copy of the multicast data into unicast data by changing a destination

address of a layer 2 of each copy of the multicast data from the multicast address into the

layer 2 address of a corresponding one of the identified clients as a destination address of the

layer 2 of the data, wherein each of the pieces of unicast data is transmitted to each of the

identified clients.

It is clear what is done to the data in order to have the data become unicast data. The

data becomes unicast data

> "by changing the destination address of the layer 2 of
> each copy of the multicast data from the multicast address into
> the layer 2 address of a corresponding one of the identified
> clients..."

Accordingly, Applicant respectfully requests that the Examiner withdraw the § 112

rejection.

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THE REJECTION UNDER 35 U.S.C. §103(a)

Claims 1-19 and 22-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable

over U.S. Patent No. 6,934,759 to Hejna, Jr. in view of U.S. Patent No. 7,254,138 to

Sandstrom. Applicant amends claims 1, 4, 19, and 22-23 in a good faith effort to further

clarify the invention as distinguished from the cited references, and respectfully traverses the

rejection.

Claim 1 recites

"a data generating unit to identify one or more clients,
each of which corresponds to a forward destination of the
forward data, based on the forward management information
stored in said storage unit, and to generate a same number of
pieces of transmission data as a number of identified clients,
wherein each of the pieces of transmission data includes
equivalent contents to the forward data and has an address of a
corresponding one of the identified clients as a destination
address of the first layer of the transmission data."

Conventionally, multicast data has multicast address of the first layer corresponding

to multicast address of the second layer higher than the first layer as destination address. In

the case where the first layer is a layer 2 defined on the OSI model and the second layer is a

layer 3 defined on the OSI model, the multicast data has MAC multicast addresses

corresponding to IP multicast addresses showing IP destination addresses. A layer 2 switch

forwards the multicast data to one or more forwarding clients by copying the multicast data.

Then, the multicast data forwarded by the layer 2 switch also arrives at clients that are not

receivers of the multicast data. This is because of the feature of the layer 2 switch that sends

copies of the multicast data from all ports of the layer 2 switch when receiving the multicast

data, broadcast data and unknown address data.

As recited in claim 1, the claimed data generating device rewrites the destination

address of the first layer of the multicast data from the multicast address to the address of a

corresponding one of identified clients. In short, the multicast data is transformed into

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unicast data at the first layer level. For example, when the first layer is the layer 2 defined on

the OSI model and the second layer is the layer 3 defined on the OSI model, the multicast

data has IP multicast addresses corresponding to IP destination addresses and MAC addresses

of the identified clients to be forwarding destinations as MAC destination addresses from the

data generating device to the layer 2 switch. Then, the layer 2 switch receiving the unicast

data forwards the unicast data to the clients without copying. The unicast data does not arrive

at the clients that are not the receivers of the multicast data.

Hejna, Jr., as cited and relied upon by the Examiner, merely describes sending data to

recipients of a recipient list by broadcast or multicast. Hejna, Jr., thus, does not disclose or

suggest rewriting MAC destination addresses of the data to MAC addresses of the recipients

that are forwarding destinations.

The Examiner cited and relied upon Sandstrom as a combining reference to

specifically address the claimed features in connection with layers of communication data,

which the Examiner conceded was absent from the disclosure of Hejna, Jr. Therefore, a

combination with Sandstrom would still have failed to cure the above-described deficiencies

of Hejna, Jr. with respect to rewriting MAC destination addresses of multicast data to MAC

addresses of the forwarding destinations, even assuming, arguendo, that such a combination

would have been obvious to one skilled in the art at the time the claimed invention was made.

In other words, even assuming, arguendo, that it would have been obvious to one

skilled in the art to combine Hejna, Jr. and Sandstrom, such a combination would still have

failed to disclose or suggest,

> "[a] data generating device installed on an upstream
> side of a switching device for performing switching based on
> data of a first layer, comprising:
> a reading unit to read out forward management
> information relating to a forwarding process of forward data to
> be forwarded to one or more clients from data of a second layer
> higher than the first layer;

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a storage unit to store the forward management information read by said reading unit;
a data generating unit <u>to identify one or more clients, each of which corresponds to a forward destination of the forward data, based on the forward management information stored in said storage unit, and to generate a same number of pieces of transmission data as a number of identified clients, wherein each of the pieces of transmission data includes equivalent contents to the forward data and has an address of a corresponding one of the identified clients as a destination address of the first layer of the transmission data</u>; and
a forwarding unit to forward each piece of transmission data generated by said data generating unit to the switching device," as recited in claim 1. (Emphasis added)

Accordingly, Applicants respectfully submit that claim 1, together with claim 2 dependent therefrom, is patentable over <u>Hejna, Jr.</u> and <u>Sandstrom</u>, separately and in combination, for at least the foregoing reasons. Claims 4, 19, and 22-23 incorporate features that correspond to those of claim 1 cited above, and are, therefore, together with claims 5-18 dependent from claim 4, patentable over the cited references for at least the same reasons.

In view of the remarks set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,

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